

Tools of the trade

Virtualisation marks a shift in how operators manage and run a network, but do they have the right people to make this happen? Kate O’Flaherty reports

When mobile carriers built their networks several decades ago, they were operating in an entirely different landscape. Today, the move to virtualisation is seeing them shift from hardware-driven deployments to software-based networks – and many lack the relevant skills to make this happen.

It is not just about IT skills: the area requires an overhaul of network teams’ entire way of thinking. Telecoms engineers who have spent decades working on hardware-focused networks must now retrain in an area traditionally driven by enterprise IT.

As part of this shift, they must become accustomed to a software-led virtualised environment, where a ‘DevOps’ mentality is key if projects are to move at the pace required.

The issue has not gone unnoticed. Mobile operators are already trying to address this gap, with many looking to re-skill existing engineers.

The US is leading the way, where firms such as AT&T have recognised software skills are becoming more important, therefore re-training workforces in the area.

Operators in Europe are doing the same, with many saying they prefer to re-train current engineers rather than take on the cost of new hires. But with roll outs and proof of concept projects imminent, they are under pressure to move quickly.

A different approach

Skills are lacking simply because of the difference virtualisation brings to the table, says Nokia IP and Optical Networks Group CTO, Steve Vogelsang.

While carriers have well-defined network, technology and operations groups, moving to x86 processor-based hardware running network function virtualization (NFV) apps puts a lot more focus on IT, Jennifer Pigg Clark, Vice President,

Network Research at 451 Research points out. “So first, they have to see who is responsible for what and then, they need to figure out the rest of their network. This creates issues in terms of training and re-training people.”

The carriers are saying that acquiring skills and retraining is a major hurdle

As part of this complexity, she says, there are issues of orchestration “which people running networks aren’t used to”, as well as “new software they have to familiarise themselves with”.

In addition, virtualised network function infrastructure (VNFI) also presents a challenge, says Clark. “There is a question of the infrastructure management the environment will run on and which applications will run over that – so they are looking at different distributions of OpenStack and VMware. This is where the skills gap is especially apparent.”

The problem often arises because operators want to cut costs by moving from VMware to open source OpenStack. Yet this can be a false economy as they look to hire OpenStack developers for a cost of up to \$175,000 (€158,000) per year, says Clark.

The move to virtualisation can also require an organisational overhaul. Until today, network and IT departments were quite separate, says Yves Bellego, Director of Spectrum Strategy and Planning, Orange. “This is not just in terms of functions but competency, processes and even the mindset of people. They were totally different worlds.”

For example, says Bellego: “Processes in IT are different: on the network side we don’t talk about the concept of ‘DevOps’.”

Yet processes will change significantly as



Child’s play: Telcos face a dilemma in how best to bring staff with them on the virtualisation journey

virtualisation increases, he says, adding: “We have tens of thousands of people working on the network. Before, this process was quite long; it took years for solutions to appear. But now, solutions are expected more quickly, so we have to move faster.”

Filling the gaps

In order to fill the skills gap, many operators are hiring new people. One example is Japan’s NTT, Accedian’s VP, Strategic Marketing, Scott Sumner explains. “They needed an analytics guy to understand what was happening in the network so they hired experts in Silicon Valley.”

Meanwhile, according to Christopher Rischard, Chief Sales Officer at DOCOMO Digital: “AT&T took some of its operations engineers and sent them on a multi-month development programme. Vodafone did something similar, but Singtel set up entirely new teams in separate buildings.”

He explains: “These are two different approaches: either train network teams or get in a new team of developers and train them on the core network.”

So which approach works best? This depends on the culture of the organisation, according to Rischard. “If your culture is nimble and flexible enough to re-train, it might be better to do a change programme.”

With this in mind, Orange is re-training current employees to work in a virtualised environment, Bellego says.

The solution should encompass both options, says Clark. “Mobile operators are re-training; they want to use existing resources. But at the same time, hiring new people is a priority.”

But operators should also be aware: re-training of network teams is not always simple, says Vogelsang. “I think by re-training, you can get part of the way there: you can add some developer skills and interfaces to manage deployment.”

Vogelsang thinks re-training will therefore be focused on understanding virtualisation’s implications. “If you really want to get into the nitty gritty, you need a new skillset – or people supplemented who can handle this,” he adds.

Finding the right people to hire can be a challenge, however, due to the limited pool of talent available. Sumner says: “The ability to configure the network to programme itself – the algorithmic guys, data scientists, the AI people –

that’s a very difficult skill to buy now.”

Therefore, carriers must not hesitate in snapping up those who can assist their virtualisation aims. According to Rischard: “One of the key questions is: are there enough telco-savvy development teams out in the marketplace? From organisations looking at this, the resounding answer is ‘no’. So what does that mean? It will benefit those who are able to find the talent, but not those who don’t snap it up.”

Meanwhile, it is important to note that the skills needed to automate networks are not always within human capacity, says Sumner. “Learnings from the world’s most advanced LTE-A networks, and 5G trials, show that massive analytics, machine learning and their ability to augment human perception are necessary to maintain stability and drive performance out of these networks.”

Vendor solutions

At the same time, vendors have been stepping in to help operators make the virtualisation journey. This is usually in the form of external

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integration support, says Clark. “So you see people like Nokia, Ericsson and Huawei trying to keep up with demand and Accenture, IBM and the other large integrators are in this market as well. The carriers aren’t afraid to call in third parties and fill the gaps.”

The vendors have the skillsets to build this type of infrastructure, Vogelsang says. “I think we just need to find the balance on how the industry ecosystem builds this. In the early days of NFV, carriers tried to build it themselves and now it’s a more balanced approach.”

At the same time, some – such as AT&T – are pushing “really hard” to develop skill sets internally and build infrastructure, says Vogelsang. “On average, most are defaulting to virtualisation, but buying the package from a vendor. We have invested in cloud and cost optimised the hardware, usually driven by

requirements, so we take on the complexity – and most operators are leaning towards that.”

It starts with a foundational product, says Vogelsang, such as Nokia’s cloud management stack. The vendor has “a catalogue of virtual network functions (VNFs) to put onto that” he says.

Although Nokia’s offering could be viewed as such, an all-encompassing ‘virtualisation-as-a-service’ is not being offered by any vendor as yet. It might seem convenient, but this type of service wouldn’t appeal to all. For example, Orange is not interested in a network supplied by just one vendor, says Bellego.

In addition, vendors can only do so much to support virtualisation, Gerry Donohoe, Technical Director, Openet, points out. This is because the move to next generation networks requires skills in every department within an operator; not just in networks and IT.

Virtualisation deployments

Overall, the skills shortage cannot be denied. But will this have a knock-on effect on virtualisation deployments? The operators themselves say no. There will not be delays because virtualised functions are not all done in one step, says Bellego. “We have made an effort of doing lab trials and proof of concepts. Typically, we do trials of one function and then roll it out,” he explains.

However, according to Clark: “In general, the carriers are saying that acquiring skills and retraining is a major hurdle to overcome and this is delaying implementations.

“If I had to estimate how much of a delay, I’d say it’s adding on about a third of the anticipated timeline to roll outs.”

The road to virtualisation will therefore be bumpy, experts agree. Although the skill sets are there to get the network functions running, says Vogelsang, the industry needs to work out how everything comes together.

He says this will require changes in the way operators organise themselves. “At the end of the day, the connectivity service providers’ core asset is still their physical infrastructure; that is hard to replace.

“They need to focus on getting the most out of that asset and this will evolve over time. They probably need to rethink how to emphasise that part of the business and shift more services to become on-demand and software-orientated.”